REAL-TIME REMOTE CONTROL CAR RACING SYSTEM (PC VERSION)

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ABSTRACT

The explosive growth of computer technology of today has broadened the minds of computer programmers and electronic engineers. Today, people from both industries are joining forces to create state of the art technology games at the international market. Therefore, we as future technopreneurs need to take this opportunity to learn about both industries and integrate them to make a useful product. In addition, this study is a new game concept which has combined with remote control hobby to create a new car racing game in the future. The idea is to use a real situation in gaming where by combining a few hardware devices (**The Revolutionizer**) and a software system (**Speed Demon ver1.0 Beta**) to make it run. The software design is being conducted using Unified Modeling Language (UML) 2.0 and being coded into Visual C++ programming language. The implementation stage is by using two types of R/C car (electric and gas) and the project has been successfully developed into a prototype product. The project is focused more on the R/C electric version. Overall, the project is now completed and ready to be market around the world. This is because the prototype which has been developed in this project has a high market value. Because of this, a business plan which contains all the information that a business plan needs to have for example, description of the product, industry analysis, marketing strategies, and the competitors. As a conclusion, this thesis is considered a unique of its kind in the information technology industry and the pioneer of turning research into money making.

ABSTRAK

Pesatnya perkembangan teknologi perkomputeran pada masa kini telah membuatkan ramai pengaturcara komputer dan jurutera elektronik berkembang idea. Kini, kedua-dua industri bergabung tenaga untuk menghasilkan permainan digital di arena antarabangsa. Justeru itu, sebagai seorang usahawan teknologi, hendaklah mengambil kesempatan ini untuk mempelajari kedua-dua idustri dan menggabungkan tenaga kepakaran untuk menghasilkan satu produk yang kreatif. Oleh kerana itu, kajian ini adalah sebuah konsep permainan digital yang menggabungkan kereta kawalan jauh untuk menghasilkan sebuah permainan digital pada masa akan datang. Ideanya adalah menggabungkan sebuah peranti perkakasan (**The Revolutionizer**) dan satu perisian komputer (**Speed Demon ver1.0 Beta**). Rekabentuk perisian komputer ini telah dibangunkan dengan menggunakan "Unified Modeling Language (UML) 2.0" dan diaturcarakan dengan menggunakan "Visual C++". Pada peringkat aplikasinya, kedua-dua jenis kereta kawalan jauh (bateri dan minyak) telah digunakan dan projek ini telah menjadi sebuah prototaip yang berjaya. Didalam projek ini, kereta kawalan jauh jenis bateri telah digunakan untuk membuat kajian. Secara keseluruhan, projek ini telah siap dan kini sedang berada di tahap promosi untuk ke seluruh dunia. Ini adalah kerana prototaip yang dihasilkan didalam projek ini mempunyai nilai komersil yang tinggi. Oleh yang demikian, satu rancangan perniagaan yang mengandungi maklumat penting seperti diskripsi produk, analisa industri, strategi pemasaran, dan juga pesaing-pesaing dari dalam dan luar negara telah dihasilkan. Akhir kata, projek ini dianggap sebagai satu penulisan yang unik bagi industri teknologi maklumat dan peneraju yang menukarkan hasil kajian kepada perniagaan yang berjaya.

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LIST OF ACRONYMS

ACRONYM	DESCRIPTION
DAC	Digital to Analog Converter
GDI+	Graphical Device Interface plus
LED	Light Emitted Diode
OSD	On Screen Display
PC	Personal Computer
Qty	Quantity
R/C	Remote Control
RM	Ringgit Malaysia
RTR	Ready to Run
UI	User Interface
UML	Unified Modeling Language
USB	Universal Serial Bus
VfW	Video for Windows

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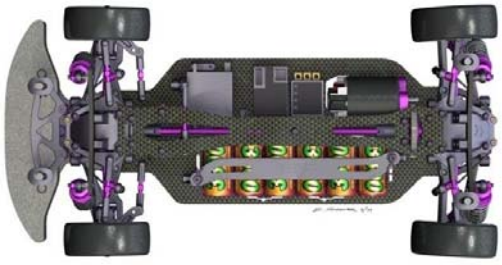
CHAPTER I

INTRODUCTION

1.1 Overview

Remote Control (R/C) or known as R/C Hobby is one of the famous hobbies in the United States. There are many companies that involves in developing R/C products. A few examples are like Airtronics and Futaba (servo, receiver and radio manufacturer), Team Trinity, Team Orion, Team Losi, OFNA Racing, Mugen Seiki, HPI Racing and more (engine and accessories manufacturer). These companies are involved with R/C cars, both electric and nitro powered.



Electric Version

Nitro/Gas Version

Figure 1.1: Electric and Nitro/Gas Version

In this project, the researcher is more interested in the electric/battery version. This is because it does not produce loud noises like the nitro/gas version. It can be played indoor and outdoor. With the new technology arising, a few R/C companies such as HPI Racing, Team Losi and a few more are developing new products. One of the products is called Mini R/C. The model is scaled 1/18th and the performance can be exactly as the normal scaled model 1/10th. There are two types of Mini R/C, on-road and off-road cars. Below is a picture of a Mini R/C from HPI Racing and Team Losi.

	
RS4 Mini Pro (HPI Racing)	**Mini-T Pro (Team Losi)**

Figure 1.2: RS4 Mini Pro (HPI Racing) and Mini-T Pro (Team Losi)

In the United States, this Mini R/C is a big hit for beginners to get slowly involved with R/C hobby. Not only that, Mini R/C is very affordable for beginners and easy to maintain. It also has accessories for hop-up (making the model more powerful such as faster and lighter).

All the above that the researcher has mentioned is more or less about R/C cars hobby. From time to time as computer technology changes, R/C companies are challenging one another to build the best model in the market. In the United States, there are professionals hobbyists where they make R/C car racing as their profession.

There are many competition being held through out the year in the United States and even internationally such as in Japan, Australia and European countries.

By looking at the situation as an opportunity, the researcher has developed a device that can bring R/C hobby into a new dimension of game development. ***Revolutionizer Beta Version*** is a hardware device with special software called ***Speed Demon Beta Version*** that can control the R/C cars by using personal computers (PC). It is being developed to be used indoor and outdoor for more excitement. The Revolutionizer can be described as a real-time simulation R/C car racing game. The Wheels set has forced feedback which players can adjust their models justification digitally and accurately. The Revolutionizer package also comes with a mini color video camera to be put into the model car. The feeling of using the Revolutionizer is like playing Grand Turismo 4 on the Playstation 2 but with more excitement and thrill.

1.2 Background of the Problem

In future, people will go for product that are more exciting and thrill. A new game concept and design must be invented to solve this problem. From time to time, people are bored with 3 Dimensional graphic views. Because of this, based on imagination and knowledge skills of the researcher, the Revolutionizer will try to take it to the next level of the gaming industry.

1.3 Problem Statement

Car racing game has been increasing for the past years. Games such as, Need for Speed Underground, Juice, Grand Turismo, V-Rally 3, Paris-Dakar Rally and lots more are among the favorites of game players because of the graphics design and

environment layout, sound effects, music, realistic features and the excitement during game play.

Despite that there are many car racing games on the market, but comparing to the Speed Demon, there are no such games being develop like the Speed Demon. Therefore, this project is focused on the statement:

"Can R/C cars be integrated with digital gaming in the future?"

1.4 Purpose of the Project

The aim of this project is to develop hardware (The Revolutionizer) and software (Speed Demon) for a new game concept in the R/C hobby industry.

1.5 Objectives of the Project

Listed below are the objectives of the project:

a) To develop hardware (The Revolutionizer) that connects between the R/C car and the personal computer.
b) To develop software (Speed Demon) that controls the R/C car and the game system.
c) To create a new game concept for the year of 2007 and to be the pioneer of this concept.
d) To create new business opportunities in Malaysia.

1.6 Importance of the Project

Computer technology is evolving in every industry and especially in the game industry. A lot of game developers are more interested in developing new algorithms and programming techniques to improve their games.

This project will be focus more on the new style of game playing with a real environment scenarios and also real damage on the cars. The project intends to take car racing game and R/C cars into a next level of game playing. With the existence of this product, hopefully, game players and R/C car hobbyist will enjoy more with excitement and thrill while playing the game. However, the product is not dangerous and will do no physical damage to game players during game play.

1.7 Scope of the Project

The scope of this project is to focus on the topic Real-time Remote Control Car Racing System (PC Version). Basically, the purpose of this project is to develop hardware and software system. Below are the listed scopes of the study:

a) To understand how the hardware that is being develop can be controlled by the personal computer.
b) Show Real-time images on the car and transfer to the monitor.
c) The software system gives force feedback to the player through the Wheels.
d) The software system controls the R/C car.
e) Identifying programming languages that are suitable to develop this prototype.

1.8 Definitions

Throughout the whole writing of this thesis, there are some words that are might be unfamiliar to readers. The words are such as:

1.8.1 Remote Control (R/C) Car

Remote Control car in this thesis is referring to the remote control hobby. It is one of the popular hobbies in the United States. There are two version for the 1:10th scale which is the nitro (Gas/Fueled) and the electric (Battery). The latest model in the market will be the Micro R/C and it only comes with electric version only. The Micro R/C comes with one package (Car and its Remote Control).

1.9 Summary

The prototype is to create a new style of game playing with real environment. It also helps the researcher to build a new game concept and game proposal. Hopefully there are gamers out there that will appreciate this product and can be one of the popular games in the market.

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